

Amendments to the Specification:

Please replace paragraph [0051] with the following amended paragraph:

[0051] To achieve the multi-level purge methods described above, an ALD apparatus 400 having a second purge conduit that is introduced upstream of the chemical gas switching manifold and in parallel with the first purge conduit is provided. This arrangement (which may be termed a dual flow purge manifold 402) is illustrated in **Figure 4**. Both purge sources may be pressure controlled (e.g., using pressure controllers 409 and 411) with set points of pressure that can be widely different. Given the current state of the art, the pressure controllers 409 and 411 cannot be fast gas switched below several hundred milliseconds (however, future pressure controllers may allow for direct, fast electronic control). We avoid this shortcoming by passing the pressurized gas through fast switching pneumatic valves (with conductances determined by the conduit lines, elbows, valve and any restrictor components in the lines between the pressure sources 409/411 down to and including the entrance 428 to the reactor 410). This implementation has each purge conduit leading to switching valves 405 and 407. These valves may be as fast (e.g., on the order of 20 msec) as are used for precursor injection valves 416 and 418.

Please replace paragraph [0052] with the following amended paragraph:

[0052] Within the dual flow purge manifold 402, valve 405 may be configured to actuate below a relatively low pressure suitable for use during the exposure pulse. Valve 407, on the other hand, may be configured to actuate below a relatively high pressure, suitable for use during the purge period. The precise timing for these valves to be switched on and off may be in a range of times around 10 – 30 msec. The turn-on and turn-off times may not need to be nor want to be coincident with the turn-on and turn-off times of the exposure pulses. This allows for reliable software control for optimizing and minimizing the time between actual switchover between the exposure and purge flows within the reactor chamber 410. This is discussed further below, in developing the concept of optimal time-phased, multi-level flow using asynchronous flow concepts.